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## ESTRANGED-GAZE PEDAGOGY

*Probing architectural computing through multiple ways of seeing*

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**Abstract.** This paper discusses the challenges of teaching architectural design theory in a world transformed by the digital revolution. Design is changing in dramatic ways and architecture is changing with it but a well-defined body of knowledge that can serve as a foundation for digital architectural design has – as yet – not been established. Relevant concepts, methods and precedents originate in many fields that are typically well beyond the scope of reading suggested to (or encountered by) students of architecture. This material is highly dynamic, often contradictory and, typically, of varying quality. Presenting this developing body of knowledge to students is a difficult challenge. A suitable pedagogical approach ought to reflect the heterogeneous and volatile nature of the contemporary design discourse enabling critical analysis of existing design practices, evidenced defence of one's own creative work and successful communication with many heterogeneous stakeholders.

**Keywords.** Critical pedagogy; digital architectural design; architectural theory; architectural education.

### 1. Introduction: a conservative revolution

The current (late 2011) situation in architectural education is characterised by a growing number of courses focusing on the practical aspects of digital architectural design. These courses attempt to address the perceived need for new pedagogies that are – as the argument goes – based on “digital design thinking” (Chiu et al. 2003, p. 583, Oxman 2006, Iordanova 2007, p. 687) and “digital architectural theory” (Oxman 2008, p. 117) rather than on what is perceived to be outdated and inadequate paper-based workflows (Oxman 2006,

p. 249). Within this understanding, new pedagogies are necessary because the underlying concepts are themselves radically new: “dynamic concepts [...] are creating a new definition of the role of representation” (Oxman 2006, p. 249), “digital techniques [...] are forging new bases for design thinking” (ibid.) and newly categorised design approaches such as “topological design” contribute to a new “philosophical worldview that attempts to accommodate the new complexity of non-linear, networked conditions, and to depart from the more static and typologically deterministic logic and design methodologies of the previous generation.” (Oxman 2006, p. 252).

I am sympathetic to the excitement generated by complex geometries and process-oriented approaches (and happily use them in my practice). If anything, they are supremely valuable as catalysts of what Caputo (1987) calls “free play” and Gallagher (1992) recognises as creative transcendences into the unknown. However, I also cannot help feeling that confining the perceived newness to the field of architecture (taken as a given, stable and unproblematic entity) and – especially – to its form-making processes is a sadly conservative posture. Why do I feel entitled to such a counter-intuitive pronouncement, and how is it relevant to the field of architectural education?

An in-depth discussion of the relevant issues is well beyond the confines of this paper but – briefly – the failure to reconsider the boundaries of the discipline and the desire to satisfy the established expectations (even if in new ways) falls within what Coyne (1996, p. 1) discussed as an essentially instrumentalist/conservative attitude to practice and education. In architectural education instrumentalism can be associated with the constricting transmission model of education (Crysler 1995) and in architectural practice with what Coyne (1996) describes as lingering links to positivism and scientism. For example, witness the now-growing desire to justify the utilisation of computing in architecture – for example as the generator of complex geometries – via bio-technical rhetoric of functional/physical building performances. Multiple citations can be provided (e.g., cf. Kolarevic and Malkawi 2005, Oxman 2008) as an illustration of this trend that Sinopoli (2010, p. viii) (in a professional book, admittedly) takes to an extreme that ignores all cultural, technical, political, logistical or ecological aspects of its vision: “[i]n due course buildings will become full of technology. Walls and ceilings will be embedded with sensors, and every aspect of a building’s performance and use will be metered and measured.”

Extending the established architectural history of styles, movements and personal philosophies with another new internal shift (e.g., parametricism) appears insufficient in relationship to the existing need. As Letherbarrow (2001, p. 85) observes, architectural knowledge is characterised by fragmen-

tation and co-presence of incompatible truth-claims. His conclusion is that architecture can only regain its authority, responsibility and cultural purpose by unmasking these truth claims and simultaneously redefining the understanding of architecture's subjects to suit current conditions. This task is greater than the commonly recurring discussion on "form follows software" (Serriano 2003, Terzidis 2009, p. xx), "form follows tool" (Rügemer 2008), "form follows media" (Asanowicz 2004) or even simply, "form follows..." (Jordanova 2007) (perhaps McDonough's (2002, p. 71) discussion of self-replication forms – such as books – following the evolution of the medium itself, Hill's (1998, p. 7) "form follows everything but function" or Mitchell's (Mitchell, 2003, p. 32) "form follows feedback" can be useful here as suggestive alternatives pointing to the concerns beyond form as form?). Conceptual shifts internal to architecture do not question the boundaries of the field or interrogate the issues of concern, instead creating a fashionable but – as before – perishable style.

Myopic understandings of architectural design persist alongside dramatic changes in the character of design in general. Increasingly, design is about leadership, team-building and campaigning rather than about artifact-making, individual inspiration and style (e.g., cf. the rhetoric by NextD or IDEO). By contrast, the encompassing discourse on technology begins to suggest that designerly approaches to knowing can offer unique contributions but that their agency depends on broad cross-disciplinary integration (e.g., Thackara 2005) and on the rethinking of design contributions in inclusive terms. This inclusiveness does not neglect the contingencies of cultural/social meaning construction (e.g., Verbeek 2005) and sees the outcomes of design in terms of power negotiations (e.g., Fuad-Luke 2009), discursive events (e.g., Krippendorff 2006), dynamic relationships between human and non-human actors (e.g., Latour 1996), etc., – it would be easy to continue.

Courses that deal with conceptual implications of computing in architecture are commonly embedded into long-established programs that not only inherit most of their content from the pre-digital era but also have a tendency to be bounded by the concerns of the architectural profession as it exists today. This grounding in history and linking to professional practice are necessary. However, they can lead to the exclusion of significant discourses that situate and critique digital technologies. Given the growing role of digital technologies in redefining many of the core social practices, a failure to consider their emerging and possible implications will increasingly curtail architecture's capabilities for envisaging and provoking possible futures.

Traditionally, the task of conceptual exploration in architectural education is fulfilled by dedicated "history and theory" modules. In our survey, which

included students from the University of Melbourne and Royal Melbourne Institute of Technology (RMIT), two themes were apparent. Firstly, none of the existing history and theory courses explicitly focus on computation and its implications. Where references to projects using digital technologies are made (with typical examples including Greg Lynn or Frank Gehry), they are discussed as variations in recurring stylistic fluctuations. In the instances where relevant discussions do occur, they focus primarily on “aesthetic capacity”. Consequently, students report that the majority of their peers do not understand the fundamental implications brought about by digital technologies. My own observations suggest, furthermore, that even where more advanced students claim greater familiarity with the contemporary theoretical discourses, they omit many areas of research and experimentation that extend beyond the challenges posed by complex geometry. In a popular phrase, they do not know what they do not know.

## **2. Method: thinking through (teaching) practice**

Undoubtedly, the relevant pedagogical offerings will multiply and the discussion on what is relevant will grow. This paper aims to contribute to this process by deriving arguments from one particular example – the *Production of Digital Space* course at the University of Melbourne. I first encountered this course when I arrived to the University in 2009. It was invented by Bharat Dave as a member of a triad of master-level electives (excuse simplistic descriptions): *Digital Design Applications* (focusing on scripting), *Contemporary Digital Practice* (analysing professional case-studies) and *Production of Digital Space* (engaging with theory). My assignment was to share the responsibility for these courses and I began by taking over *Production of Digital Space*.

The opportunity of teaching such a course can be understood as the challenge of understanding (and questioning) the general institutional context and the course-specific inheritance: the triad superstructure, the theory orientation, the ringing course title, the deliberately flexible handbook outline and the didactical structure of a seminar. This paper cannot contain an in-depth analysis of this pedagogical engagement. Instead, the experience of teaching this course provides an illustration of sense-making, in real-world circumstances. Consequently, my observations have no ambition to form a generalist framework directly useable by others. Instead, they seek to contribute by (1) asking familiar questions in specific conditions; and (2) providing and justifying idiosyncratic answers. I hope that this exposition can provide fuel for the ongoing (and necessary) conversation on the issues at stake.

### 3. Theme: what is theory?

Given that this paper emerges from a practical experience of teaching a course intended to engage with theoretical implications, it is prudent to briefly consider the very concept of theory.

Hays (1998) understands theory as a practice of mediation or “the production of relationships between formal analyses of a work of architecture and its social ground or context [...], but in such a way as to show the work of architecture as having some autonomous force with which it could also be seen as negating, distorting, repressing, compensating for, and even producing, as well as reproducing, that context.” Hays bases his understanding on Jameson’s (1981, p. 40) notion of mediation as a particular way to analyse distinct levels of reality. In this view, mediation is a device of the analyst. This device is able to overcome – even if only in local and specific circumstances – the apparent fragmentation of social life. Such devices can be valid only because “social life is in its fundamental reality one and indivisible, a seamless web, a single inconceivable and transindividual process, in which there is no need to invent ways of linking language events and social upheavals or economic contradictions because on that level they were never separate from one another.”

Thus, the linking or making of relationships is the central capacity of theory. And yet, this capacity is undermined by what Agrest (1991, p. 1) perceives as “an absolute separation between theory and practice [...]”. She sees the difference between theory and practice as the dissimilarity between discourses (analytical, exploratory, critical on one hand and normative on the other) but for her the separation remains very real.

At the same time, another line of reasoning persuasively proposes that contemporary design’s contributions are (significantly, or even primarily) to the discourse (broadly understood) (Krippendorff 2006, Schumacher 2011) operating within “experience economy” (Pine II and Gilmore 1999). Elsewhere, I have also argued (Roudavski 2008) that architectural output can be usefully interpreted in terms of situated performances supported by multiple actors. As Rampley (2005) suggested, “architecture needs to be thought of less as a set of special material products and rather more as [a] range of social and professional practices that sometimes, but by no means always, lead to buildings.”

How do these conditions frame theory, especially in a pedagogical context? Multiple interpretations are possible but I find one particularly productive. This interpretation sees theory, practice and objects/subjects of architecture as cultural constructs, sustained by technologies and meaningful in human societies. This understanding allows one to focus on the discussion of situated techno-social performances in a way that transcends disciplinary or conceptual boundaries (e.g., between theory and practice, built environment and

nature, structures and media or architectural profession and other designerly ways of knowing).

#### **4. Pedagogy: altered gaze**

How does this conceptual position materialise in a practical pedagogy? This paper is too concise to go into details (which I am happy to share on request). Instead of explaining the particulars of the course, I shall, therefore, present a conceptual stance that considers the relationships between the teacher, the subject and the students as fluid and opportunistic.

I find the metaphor of vision tricks used in life drawing useful as a device-to-think-with. When drawing, one squints to simplify, turns the image upside down to check proportions, measures with a pencil in an outstretched arm to control scale, draws without looking at the paper (or even with the eyes closed) to decouple the trace-making from the conscious analysis and so on. People arrange their drawing studies as varying temporal engagements, from a 10-second sketch of a nude to a portrait of 20 sessions. They draw posed skeletons in anatomical theatres and pacing tigers in the zoos, outline with 5H pencils and paint wet on wet, etc., etc. These techniques are combined opportunistically according to the circumstances, often not with a purpose of producing a completed object but with the intention of amplifying one's understanding.

My pedagogy adopts a similar strategy – which encourages what I have called here an “estranged gaze”. Accepting that it is not possible to cover the vast and volatile field of contemporary technology in any detail, I – instead – seek to provide students with an opportunity to capture it in their work. This capturing takes multiple forms, from essays to speeches and from charettes to extended research projects. This strategy is applied within the *Production of Digital Space* course but also extends beyond its confines, emerging as a loosely interconnected palette of teaching initiatives occurring at multiple levels of expertise, in different formats, between institutions and across professional/educational communities. Narrative lines cross the boundaries of individual courses and students can follow them if they so choose.

The *Production of Digital Space* course takes the form of a semester-long seminar series. Within it, students read, discuss and write essays. The seminar invites guest experts and encourages practical experimentation. Elements of this structure will be familiar in a variety of disciplines. More unusual (I would say innovative if I had better information on the courses taught by others – not many are described in existing literature) is its attitude to the selection of content. In the area where there are no established theories or practices and where most of the relevant literature is embedded into extensive and complex

multidisciplinary discourses, the course chooses to provide a strong narrative line exemplified by extensive lists of eclectic case-studies and readings whose main purpose is to estrange the participants' gaze and prevent the comfortable preference of thinking in conventional, discipline-specific terms.

To illustrate, in 2011 the course covered the following thematic areas (names in the brackets indicate the intellectual pedigrees): (1) *Lived Space*, or the discussion on the fundamental roles of architecture including its conceptualisation as a system of performances with references to the extended and "fluid" nature of objects (cf. Annemarie Mol) and the understanding of places as dynamic and distributed (cf. Doreen Massey); (2) *Design Space*, or the discussion of designing as a unique way of knowing (cf. Richard Coyne), Design 3.0 (cf. GK VanPatter), distributed creativity (cf. Rober Sawyer) and contemporary visual thinking (cf. Birger Sevaldson); (3) *Representational Space*, or the consideration of digital phenomena as subjective constructs ranging from theories of montage (cf. Sergei Eisenstein) to *dingpolitik* (cf. Bruno Latour); (4) *Virtual Space*, from the boredom of architectural flythroughs to the architecture of massive persistent online games (cf. Espen Aarseth, Richard Bartle or Julian Oliver); (5) *Augmented Space*, including the discussion on ubiquitous and location-aware computing (cf. Tim and Jan Edler, Hiroshi Ishii and Malcolm McCullough); (6) *Parametric Space*, including generative approaches and their links to building performance (cf. Branko Kolarevic or Michael Weinstock); (7) *Complex Space*, or the discussion on artificial intelligence and artificial life (cf. Ernest A. Edmonds vs. Michael Hensel or Tom Verebes vs. Robert Venturi); and (8) *Networked Space*, including the consideration of objects with histories (cf. Bruce Sterling) and architectures spanning multiple places and temporal streams.

Throughout, the seminar exposes its leader's positions but includes texts and examples presenting varying and contradictory viewpoints. Many of the included items emerge from previous discussions and collaborative projects with students and colleagues within and outside of this seminar. As a result, students' research topics reflect the diversity of themes and the multiplicity of scales: digital architecture and nature analogies, resistance to digital design in architectural practice, gamification, parametricism, videogame architecture, copyright and authorship, participatory design, early design and computation, responsive materials, commercialism in cyberspace (Roudavski and Parton 2011), local optioneering (publication forthcoming), computation in building construction, spatial behaviors, robotic fabrication, virtual geographies, ornamentation, science-fiction architecture, augmented everyday, habitation in hybrid/virtual space, self-replicating structures, gestural interfaces, etc. I cannot demonstrate their quality here (some are published/exhibited/awarded

while others are – well – basic) but hopefully, they show the participants' efforts to reach out.

### **5. Conclusion: looking and seeing**

According to the students' feedback, the strategy of probing into multiple, far-reaching topics produced significant shifts in their understanding of design and technology or broadened their outlook on what is relevant. This is encouraging but – for me – unsurprising because my frequent impression is that most contemporary students (I am told students used to be rowdy in the days gone by) are more conservative than their teachers and – something this course is trying to disturb – immersed with no second thoughts in the intro-architectural concerns. Given this, I take their willingness to risk an unfamiliar topic and the demonstrated readiness to engage as success.

The experience of teaching this course suggests that patchwork pedagogies engaging with multiple perspectives and degrees of magnification might be useful as sites of critical analysis, disagreement and comparative sense-making. By accepting the plurality of engagement as the primary characteristic, this approach seeks to provide the experience of seeing differently in the hope of equipping the students with the confidence to assemble their own interpretative systems from whatever tricks seem appropriate, whatever the initial complexity and ensuing confusion.

A chance to consider relevant, questionably relevant and frankly “out there” issues encourages unorthodox thinking about career paths, business models and cross-disciplinary collaborations. When this thinking is tested through thought experiments, case-study analyses, critical writing and practical work, participants gain a chance to accumulate creative expertise and construct alternative track records that can serve as evidence in discussions with uninitiated others. Such discussions are going to become more common if – as commonly predicted – design complexities will continue to increase, necessitating regular exchanges with collaborators acculturated into different languages and value systems. In these situations, an ability to justify creative decisions and translate between domains will prove especially valuable. This is already evident in the situations where students need to explain and defend their experimentation (commonly that with complex geometry) during design crits, sometimes in the face of (variously justified) skepticisms towards most things digital. As one student stated in an answer to the question “has the course influenced your outlook on the digital technologies and why/how?” – “[y]es, I have a greater sense of the wider cultural attachment of digital practices discussed in the subject and the [...] grounding many of the technologies have in theoretical discourse. This has provided a degree of validity to an



area otherwise referred to in purely aesthetic or insubstantial terms within the university environment, which I found helpful to furthering my interests and capacity to contribute.”

These ambitions are in line with the overarching conceptual outlook that sees the goal of education in transformation and capability building, not in the delivery of information. This, once again, is a move aimed to overcome the divide between theory and practice by making the outcomes of a theoretical course become meaningful as enablers of design or – in Perkins’s (2008) classification – “proactive knowing”.

The work in this area ought to continue and I would be very interested to hear of the strategies employed by others.

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